State of California
The Resources Agency
Department of Water Resources

EXHIBIT C
CONSTRUCTION HISTORY
AND
PROPOSED CONSTRUCTION SCHEDULE

Oroville Facilities
FERC Project No. 2100

January 2005

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CONSTRUCTION HISTORY AND PROPOSED CONSTRUCTION SCHEDULE

The following information is provided in compliance with the requirements of CFR 18, Chapter 1, Subchapter B, §4.51(d).

1.0 GENERAL PROJECT DESCRIPTION

1.1 OVERVIEW

The Oroville Facilities (FERC Project No. 2100) were developed as part of the State Water Project (SWP), a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants. The main purpose of the SWP is to store and distribute water to supplement the needs of urban and agricultural water users in northern California, the San Francisco Bay area, the San Joaquin Valley, and southern California. The Oroville Facilities are also operated for flood management, power generation, water quality improvement in the Delta, and recreation and fish and wildlife enhancement.

FERC Project No. 2100 encompasses 41,100 acres and includes Oroville Dam and Reservoir, three power plants (Hyatt Pumping-Generating Plant, Thermalito Diversion Dam Powerplant, and Thermalito Pumping-Generating Plant), Thermalito Diversion Dam, the Feather River Fish Hatchery and Fish Barrier Dam, Thermalito Power Canal, Oroville Wildlife Area (OWA), Thermalito Forebay and Forebay Dam, Thermalito Afterbay and Afterbay Dam, and transmission lines, as well as a number of recreational facilities. An overview of these facilities is provided on Figure C.1.1-1. The Oroville Dam, along with two small saddle dams, impounds Lake Oroville, a 3.5 million acre-feet (maf) capacity storage reservoir with a surface area of 15,810 acres at its normal maximum operating level.

1.2 EXISTING POWER FACILITIES

The hydroelectric facilities have a combined license generating capacity of approximately 762 megawatts (MW). The Hyatt Pumping-Generating Plant is the largest of the three power plants with a capacity of 645 MW. Water from the six-unit underground power plant (three conventional generating and three pumping-generating units) is discharged through two tunnels into the Feather River just downstream of Oroville Dam. The plant has a generating and pumping flow capacity of 16,950 cubic feet per second (cfs) and 5,610 cfs, respectively. Other generation facilities include the 3 MW Thermalito Diversion Dam Powerplant and the 114 MW Thermalito Pumping-Generating Plant.

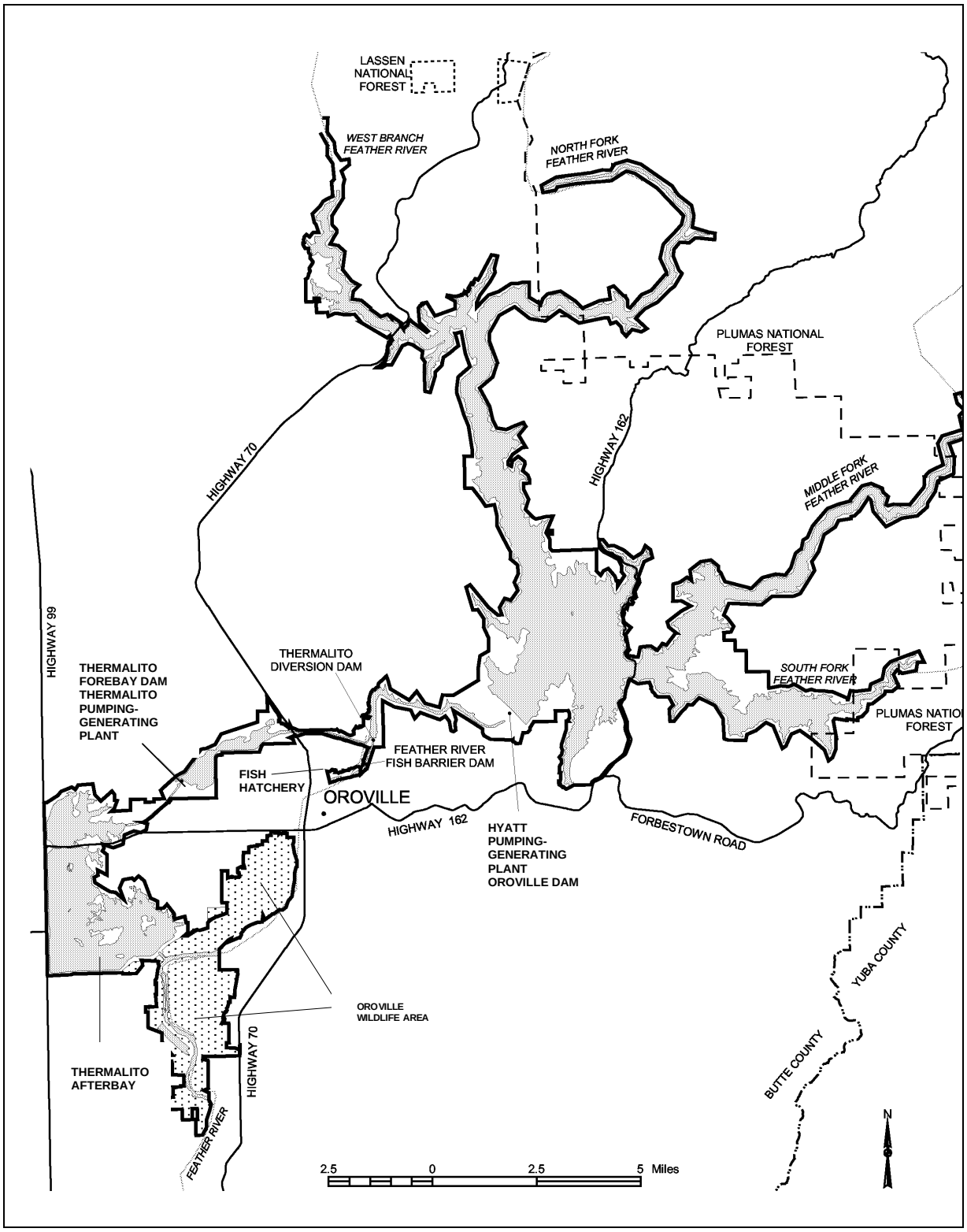

Figure C.1.1-1. Oroville Facilities features location map.

Thermalito Diversion Dam, four miles downstream of the Oroville Dam creates a tail water pool for the Hyatt Pumping-Generating Plant and is used to divert water to the Thermalito Power Canal. The Thermalito Diversion Dam Powerplant is a 3 MW powerplant located on the left abutment of the Diversion Dam. The power plant releases a maximum of 615 cfs of water into the river.

The Thermalito Power Canal is a 10,000-foot-long channel designed to convey generating flows of 16,900 cfs to the Thermalito Forebay and pump-back flows to the Hyatt Pumping-Generating Plant. The Thermalito Forebay is an off-stream regulating reservoir for the Thermalito Pumping-Generating Plant.

The Thermalito Pumping-Generating Plant is designed to operate in tandem with the Hyatt Pumping-Generating Plant and has generating and pump-back flow capacities of 17,400 cfs and 9,120 cfs, respectively. When in generating mode, the Thermalito Pumping-Generating Plant discharges into the Thermalito Afterbay, which is contained by a 42,000-foot-long earth-fill dam. Thermalito Afterbay is used to release water into the Feather River downstream of the Oroville Facilities, helps regulate the power system, provides storage for pump-back operations, and provides recreational opportunities. Several local irrigation districts receive water from Thermalito Afterbay.

1.3 EXISTING ENVIRONMENTAL AND RECREATION COMMITMENTS

The Feather River Fish Barrier Dam is downstream of the Thermalito Diversion Dam and immediately upstream of the Feather River Fish Hatchery. The flow over the dam maintains fish habitat in the low-flow channel of the Feather River between the dam and the Thermalito Afterbay Outlet and provides attraction flow for the hatchery. The Feather River Fish Hatchery, an anadromous fish hatchery, was built to compensate for the loss of spawning grounds and rearing areas for returning salmon and steelhead trout and their offspring; the spawning grounds and rearing areas were lost due to construction of Oroville Dam. The hatchery has recently accommodated more than 20,000 adult fish and 15 million young fish annually.

The Oroville Facilities support a wide variety of recreational opportunities. These opportunities include: boating (several types), fishing (several types), fully developed and primitive camping (including boat-in and floating sites), picnicking, swimming, horseback riding, hiking, off-road bicycle riding, wildlife watching, and hunting. There are also visitor information sites with cultural and informational displays about the developed facilities and the natural environment. There are major recreation facilities at Loafer Creek, Bidwell Canyon, Spillway, North and South Thermalito Forebay, and Lime Saddle. Lake Oroville has two full-service marinas, five car-top boat launch ramps, ten floating campsites, and seven dispersed floating toilets. There are also recreation facilities at the Visitors Center and the OWA.

The OWA comprises approximately 11,000-acres west of Oroville that is managed for wildlife habitat and recreational activities. It includes the Thermalito Afterbay and surrounding lands (approximately 6,000 acres) along with 5,000 acres adjoining the Feather River. The 5,000-acre area straddles 12 miles of the Feather River, which includes willow and cottonwood-bordered ponds, islands, and channels. Recreation areas include dispersed recreation (hunting, fishing, and bird watching), plus recreation at developed sites, including Monument Hill Day Use Area, model airplane grounds, three boat launches on Thermalito Afterbay and two on the river, and two primitive camping areas. California Department of Fish and Game's (DFG) habitat enhancement program includes a wood duck nest-box program and dry land farming for nesting cover and improved wildlife forage. Limited gravel extraction also occurs in a number of locations.

2.0 CONSTRUCTION HISTORY

The Oroville Division was first authorized by the Legislature in 1951 as part of the Feather River Project. The original application for a license from the Federal Power Commission (FPC), predecessor to the Federal Energy Regulatory Commission, to construct facilities at Oroville was dated January 31, 1952. This license application was revised August 31, 1953, and further amended October 31, 1955. In 1955 the Division of Water Resources, Department of Public Works, predecessor to Department of Water Resources, submitted a second report to the Legislature on the Feather River Project. This report found that the Feather River Project, including the Oroville Facilities, had engineering and financial feasibility and recommended that construction proceed. The Federal Power Commission issued an order to the Water Project Authority issuing a license (major) on December 14, 1956, for the Oroville Facilities (Feather River Project, Oroville division). This order covered the project for a concrete dam and power generating facilities. Subsequently the Legislature set up a new agency, the Department of Water Resources, and gave it the authority to implement the State Water Plan. On February 11, 1957, the Federal Power Commission issued a 50-year license, effective February 11, 1957, to the Department of Water Resources to construct and operate the Oroville Facilities (FERC Project No. 2100) in Butte County, California. Funds were appropriated for construction in 1957.

DWR submitted an amendment to the Federal Power Commission dated October 30, 1959, which reflected changes to include an embankment type dam as opposed to the concrete type dam previously approved and added the Thermalito power features. This amendment included an increase in the power output of the project due to the addition of the Thermalito Pumping-Generating Plant and an increase in the capacity of Hyatt Pumping-Generating Plant (formerly called Oroville Powerplant). This amendment, with subsequent modifications, was finally approved by the FPC on July 11, 1962. The approval covered the zoned earth and rockfill section for Oroville Dam and the design proposed for the Thermalito Diversion Dam.

2.1 DAMS, RESERVOIR AND POWER FACILITIES

2.1.1 Lake Oroville (also known as Oroville Reservoir)

The Lake Oroville area is rich in gold mining history. Gold was discovered in 1848 at Bidwell Bar, a larger sandbar named after John Bidwell, who became one of California's leading citizens. The resulting rush of gold-seekers created the city of Oroville, county seat of Butte County. Lake Oroville with its auxiliary facilities was built by DWR. Its major function is to conserve and regulate the flows of the Feather River for subsequent release for various project purposes. The maximum capacity of the lake is 3.5 maf. It was formed by damming the Feather River. Lake Oroville began to fill on November 14, 1967, when the second of two diversion tunnels that carried the Feather River beneath the embankment during construction was blocked. It was formally dedicated on May 4, 1968 and was added to the Northern California water system in the same year.

2.1.2 Oroville Dam

In 1960, voters approved a bond issue to begin construction of Oroville Dam. All of the dam and lake structures were designed by DWR. Construction of the project commenced in 1957 with highway and railroad relocation of Highway 70 and the Union Pacific Railroad. Actual work on the dam began in 1961 by the Oro Dam Constructors. The embankment was topped out in October 1967, and the spillway was finished in February 1968. The official dedication ceremony was held on May 4, 1968.

Oroville dam is located in the foothills on the western slope of the Sierra Nevada, one mile downstream of the junction of the Feather River's major tributaries. It's the highest earthfill dam in the U.S. rising 770 ft above streambed excavation and spanning approximately 5,600 ft between abutments. The dam forms the impoundment for Lake Oroville and the upstream control for the Oroville Facilities. Design and construction of the project was multi-faceted and included construction of the dams, tunnels, outlets, spillways, powerplant and operating facilities, and the relocation of upstream and downstream infrastructure (bridges, roads, etc).

The Oroville Dam and Lake Oroville were formally transferred from a construction to an operational status on December 17, 1969 and approved on December 19, 1969.

2.1.3 Saddle Dams

Early designs for Bidwell dam combined the location for Oroville Quincy Road and Feather River Railroad with the dam. That is, the dam crest was to be wide enough to carry both the road and railroad.

Saddle dams included the Bidwell Canyon and Parish Camp Saddle dams. These two dams are low earthen structures which complement Oroville Dam in containing Lake Oroville. They are part of the State Water Project, Oroville Division authorized by the Burns Porter Act of 1959. The dams were constructed in 1967, under specification No. 66-42, Oroville Peripheral Dams, Contract No. 355655. The contractor was Harms Brothers of Sacramento.

2.1.4 Hyatt Pumping-Generating Plant (Edward Hyatt Powerplant)

Located in rock in the left abutment near the axis of Oroville Dam, Hyatt Pumping-Generating Plant (formerly called Oroville Powerplant) is an underground, hydroelectric, pumping-generating facility. The facility was named for Edward Hyatt, who was State Engineer (1927-1950) of the Division of Water Resources under the Department of Public Works. Hyatt Pumping-Generating Plant has six generators (three for reversible pump back operation), and a license capacity of approximately 645 MW.

Construction of the plant began in 1964 by McNamara-Fuller, a Joint Venture, located in Burlingame, California. Final inspection was completed and accepted on April 4, 1967. The contract was formally accepted by DWR on May 16, 1967.

2.1.5 Diversion Pool

The Diversion Pool acts as a forebay when Hyatt Pumping-Generating Plant is pumping water back into Lake Oroville. It also provides recreational opportunity. This pool stores 13,350 acre-feet (af) with water surface elevation of 225 ft, 320 acres water surface area and 10 miles of shoreline.

2.1.6 Thermalito Diversion Dam

Thermalito Diversion Dam forms the Diversion Pool, on the Feather River immediately downstream from the tailrace of the Hyatt Pumping-Generating Plant. It diverts water in Thermalito Power Canal for power generation at Thermalito Pumping-Generating Plant and creates a tailwater pool for Hyatt Pumping-Generating Plant. Due to the combined nature of Thermalito Diversion Dam and Oroville Dam, minimal plant facilities were constructed at Thermalito. The cableway used at Oroville Dam was also moved to Thermalito.

The Thermalito Diversion Dam and appurtenances consist of a concrete gravity dam, outlet works, access and maintenance roads, canal intake structure, and a section of Thermalito Power Canal. The constructor was instructed to proceed with the work on August 13, 1962. Construction under the main contract was completed April 26, 1968. The diversion dam was placed in service in October 1967.

2.1.7 Thermalito Diversion Dam Powerplant

Thermalito Diversion Dam Powerplant is located at Thermalito Diversion Dam below the left abutment of the dam and has a license capacity of approximate 3 MW, 615 cfs, normal static head is 63-77 ft with design dynamic head of 67 ft.

The powerplant generates electricity from water released to the Feather River to maintain fish habitat between Thermalito Diversion Dam and Thermalito Afterbay Outlet. Construction was completed on August 26, 1987.

2.1.8 Thermalito Power Canal

Thermalito Power Canal, concrete-lined with 10,000 ft length and maximum generating flow of 16,900 cfs and maximum pumping flow of 9,000 cfs, extends from a headworks structure, which is part of Thermalito Diversion Dam to Thermalito Forebay. It conveys water in either direction between Thermalito Diversion Dam and Thermalito Forebay for pumping and power generation at Hyatt Pumping-Generating Plant and Thermalito Pumping-Generating Plant.

The contract for construction of the Power Canal was awarded on September 8, 1965. The actual work began October 7, 1965 by Morrison-Knudsen Co., Inc. and was completed on October 15, 1967. The canal was placed in service during October 1967.

2.1.9 Thermalito Forebay

Thermalito Forebay consists of the dam, reservoir, Nelson Avenue county road relocation and recreation areas. It is an offstream reservoir contained by Thermalito Forebay Dam on the south and east and by Campbell Hills on the north and west, and it was located about four miles west of the city of Oroville.

Thermalito Forebay conveys generating and pumping flows between Thermalito Power Canal and Thermalito Pumping-Generating Plant, provides regulatory storage and surge damping for the Hyatt-Thermalito power complex, and serves as a recreational site.

The maximum operating storage of Thermalito Forebay is 11,770 af; water surface elevation is 225 ft while water surface area is 630 acres with 10 miles of shoreline.

Plans for Thermalito Forebay and Afterbay were completed in June 1965 and construction was completed in October 1967.

2.1.10 Thermalito Forebay Dam

Thermalito Forebay Dam was constructed between 1965 and 1968 by Guy F. Atkinson Co. of South San Francisco. Thermalito Forebay Dam is homogeneous and zoned earthfill dam, located on the north and west of Thermalito Forebay. Its embankment volume is 1,840,000 cubic yards; height of 91 ft with the crest length of 15,900 ft and 231 ft crest elevation.

2.1.11 Thermalito Pumping-Generating Plant

Located about four miles west of the city of Oroville in Butte county, Thermalito Pumping-Generating Plant is a principal feature of the Oroville Facilities pump storage power complex. A pumping-generating plant, the facility is operated in tandem with Hyatt Pumping-Generating Plant and Thermalito Diversion Dam Powerplant to produce power.

The pumping capacity is 9,120 cfs, 120,000 hp; normal static head is 85-102 ft and design dynamic head is 99 ft with three pumping units while generating capacity is 120 MVA, 17,400 cfs. Normal static head is 85-102 ft and design dynamic head is 95 ft with four generators (three for reversible pump back operation).

Water released for power in excess of local and downstream requirements is conserved by pumpback operation during off-peak hours through both power plants into Lake Oroville to be subsequently released for power generation during periods of peak power demand. Construction on the plant, by Guy F. Atkinson Company, began in December 4, 1964 and was completed in January 24, 1969 and accepted in February 13, 1969, with operation of one pump generator unit (No. 4) in February 1968, and another (No. 3) in April 1968.

2.1.12 Thermalito Afterbay

Located about six miles southwest of the city of Oroville, Thermalito Afterbay is an offstream reservoir. It provides storage for the water required by pumpback operations to Lake Oroville, helps regulate the power system, produces controlled flow in the Feather River downstream from the Oroville Facilities, and provides recreation. The maximum operating storage of Thermalito Afterbay is 57,040 af; water surface elevation is 136.5 ft and water surface area is 4,300 acres with 26 miles of shoreline.

On October 12, 1967, water was released through the bypass of Thermalito Pumping-Generating Plant into a small, temporarily diked area of the Thermalito Afterbay. The initial filling of Thermalito Afterbay began on November 15,1967, with the commencement of regulated releases from Lake Oroville. Releases from the Thermalito Afterbay to the Feather River commenced on December 26, 1967.

2.1.13 Thermalito Afterbay Dam

Thermalito Afterbay Dam has the longest crest in the State Water Project system; it is an homogeneous earthfill dam with an embankment volume of 5,020,000 cubic yards. The dam height is 30 ft with crest length of 42,000 ft and 142 ft crest elevation. The facility was constructed by Guy F. Atkinson Company, from October 25, 1965 to April 1, 1968 and completed on April 19, 1968.

2.1.14 Thermalito Afterbay Outlet

Thermalito Afterbay Outlet is the biggest outlet structure in the Thermalito Afterbay. Outlet structures in Thermalito Afterbay are Thermalito Afterbay Outlet, Sutter Butte Outlet, PG&E lateral Outlet, Richvale Irrigation District Outlet and Western Canal Outlet. The Thermalito Afterbay Outlet consists of five 14-foot by 14-foot radial gates with maximum capacity of 17,000 cfs.

A construction contract was awarded on December 1965, and Thermalito Afterbay Outlet was completed in August 1969 by Rodney Hunt Machine Company.

2.2 EXISTING ENVIRONMENTAL AND RECREATION COMMITMENTS

2.2.1 Feather River Fish Hatchery

The Department of Fish and Game, in February 1960, proposed a fish hatchery on the north bank of the Feather River downstream of the Oroville-Chico Bridge. The facility was cooperatively planned by DWR and the California Department of Fish and Game, with the advice of the U.S. Fish and Wildlife Service and other agencies.

The Feather River Fish Hatchery was built to compensate for spawning grounds lost to returning salmon and steelhead trout with the construction of Oroville Dam. The first salmon and steelhead entered the hatchery in September 1967. In a ten-year period (from 1981 to 1991), the return of spawning adult salmon increased from an average of 39,000 to an average of 51,000 per year.

The Feather River Fish Hatchery comprises a barrier dam on the Feather River, a fish ladder, fish trapping and handling facilities, a maintenance and office building, access and maintenance roads and a fish loading area. Funding was provided by the SWP contractors and DWR. It is operated by the Department of Fish and Game and maintained by DWR. Work recently completed at the Feather River Fish Hatchery has improved conditions for the rearing of fish and made it easier for visitors, including those with disabilities, to observe hatchery operations.

The construction of the Feather River Fish Hatchery, by Farzier-David Construction Co., contract No. 351872, started on March 16, 1962 and was completed on May 8, 1964. Peterson & Brown – Ely Company expanded the Feather River Fish Hatchery. Expansion work began on May 16, 1966 under contract No. 354906, and was completed on December 12, 1967, and final inspection of the completed work was made on December 18, 1967. Transfer of the Feather River Fish Hatchery to operational status was approved in June 1968. The Hatchery is operated by the Department of Fish and Game. It was expanded again by Westcon Company on July 10, 1997, contract No. C51131, and completed on October 20, 1997.

2.2.1.1 Fish Ladder

Salmon and steelhead, raised at the hatchery, are released in the Feather River and in the Sacramento-San Joaquin Estuary to find their way to the Pacific Ocean where they grow and mature. After two to four years in the ocean, they instinctively return to their place of origin. They proceed through the Delta and up the Sacramento River. They then continue their journey up the Feather River to the hatchery. Major features to guide the fish from the Feather River to the hatchery include the fish barrier dam and fish ladder.

The fish ladder located immediately downstream from the barrier dam is a reinforced concrete structure, 2,150 ft long, pool length from 8 to 1,000 ft and minimum width of 6 ft. The water depth is 2 ft minimum. The velocity of flow in the fish ladder is from two to five ft per second with maximum drop between pools of one foot.

2.2.1.2 Hatchery Spawning Building

The Hatchery Spawning Building is the location where artificial spawning takes place. The main hatchery building houses the spawning operations area and incubators. On either side of the building, just beyond the gathering tank are viewing windows where the spawning operations can be observed by the public.

2.2.1.3 Rearing Raceways

Concrete-lined raceways block off in intervals to form 48 individual pools 100 ft long, 10 ft wide. The raceways hold young fish fingerlings and yearlings until they are ready for release.

Water flow and velocity in the raceways are 3 to 5 cfs at 0.1 foot per second.

2.2.1.4 Thermalito Fish Rearing Facility

Located on the west side of the Thermalito Afterbay, the facility is used to raise salmon fry susceptible to the Sacramento River Chinook Disease (a cold water virus). Its two rearing pond raceways can raise 2.5 million fingerlings for planting in the Central Valley river system.

2.2.1.5 Ultraviolet Water Treatment Facility

A new ultraviolet water treatment system at the Feather River Fish Hatchery delivers disinfected water to two new fish-rearing raceways (and to the hatchery's older raceways), as well as to a new hatchery building.

2.2.1.6 Fish Barrier Dam and Pool

The Fish Barrier Dam and Pool, located upstream of the Feather River Fish Hatchery, divert fish into a fish ladder that leads to the hatchery. Flows at the dam are controlled by releases at Oroville Dam and Thermalito Diversion Dam.

The Fish Barrier Dam was constructed as part of the Oroville Facilities. The design, plans and specifications were started in March 1961. Construction of the dam began in April 1962 and was completed in May 1964. It is a concrete gravity dam with 9,300 cubic yards of concrete 91 ft height. The crest length and crest elevation is 600 ft and 181 ft, respectively while the Fish Barrier Pool is 580 af gross storage capacity, 50 acres water surface area, and one mile of shoreline.

2.2.2 Recreation Facilities

2.2.2.1 Lake Oroville Visitors Center

The Lake Oroville Visitors Center was built between 1973 and 1974 and is located just east of Oroville Dam, high above the lake atop Kelly Ridge. This vantage point provides a commanding view of the dam, Bidwell Bar Bridge, and various arms of Lake Oroville. In addition to informational displays inside the Visitors Center, there is a 47-ft viewing tower that provides a panoramic view of Lake Oroville and its surroundings. Exhibits in the center focus on the history of early water development, the construction of the Oroville Facilities, and the State Water Project and its benefits. Parks and recreation exhibits look at the history of the Oroville area and its resident wildlife.

2.2.2.2 Bidwell Canyon and Lime Saddle Marinas

Two marinas at Lake Oroville provide a variety of recreational activities including boat rentals. Bidwell Canyon Marina has a seven-lane boat-launching ramp, which was recently extended to 700 ft msl. It is located approximately one mile East of Oroville Dam on the southern shore of Lake Oroville. Lime Saddle Marina has a three-lane boat-launching ramp, picnic facilities, fishing and boating supplies, gas and oil. The marina is located on the West Branch of the Feather River near Lime Saddle Road.

Both Bidwell Canyon and Lime Saddle Marinas' projects were completed in January 2003 by Guiton & Sons constructor.

2.2.2.3 Spillway Recreation Area at Oroville Dam

The Spillway Recreation Area at Oroville Dam has a boat launching ramp that consists of two multi-lane, eight lanes and 12 lanes, in addition to a variety of outdoor recreation. The boat launch ramp was recently extended to 700 ft msl, providing use of the ramp at lower reservoir levels than was previously available. This site also provides day-use activities such as picnicking and bike riding. This Spillway Boat Launch and Day Use Area was recently reconstructed to improve traffic patterns and add several amenities to enhance recreation and scenery at the boat launching area. The reconstruction project started in June 2001 and was completed in 2003 by C & C Construction.

2.2.2.4 Enterprise Ramp and Day Use Area

The Enterprise Ramp and Day Use Area provides boat launching access. It has a two-lane boat launch ramp. The end of the ramp is at approximately 830 ft msl. It was built between 1975 and 1976.

2.2.2.5 Car-Top Boat Launch Ramps

The Lake provides car-top Boat Ramp access at Dark Canyon, Foreman Creek, Nelson Bar, Stringtown, and Vinton Gulch. These locations also provide access to boaters launching canoes and other water crafts.

Dark Canyon Car-Top Boat launch Ramp has a single-lane boat launch ramp. There are three pull-out areas between the parking lot and the end of the boat launch ramp, which is helpful because the road is narrow. Foreman Creek Car-Top Boat Launch Ramp has a two-lane boat launch ramp that is used at low water. Nelson Bar Car-Top Boat Launch Ramp is located on the West Branch of the North Fork arm of Lake Oroville.

2.2.2.6 Campground and Day Use Areas

Lake Oroville has several campground facilities around the lake that includes Bidwell Canyon Campground and Day Use Area, Lime Saddle Campground and Day Use Area, and Loafer Creek Campground and Day Use Area. Recreation use of Lake Oroville commenced on April 4, 1968 when the Loafer Creek recreation area and the spillway boat ramp were opened to the public.

Bidwell Canyon Campground facilities include a visitor information station and fee collection booth as well as a marina. The boat launch ramp was recently extended to 700 ft msl, providing use of the ramp at lower reservoir levels than was previously available. The project was completed in January 2003.

Lime Saddle Campground, built in 2001, is one of the major attractions of the Oroville Complex, 43 single-vehicle parking spaces and 127 car/trailer spaces in the main parking area.

Loafer Creek Campground is the largest campground. It has 137 family campsites, each containing a parking space, table, and stove. Drinking water, restrooms, hot showers, and laundry tubs are nearby.

2.2.2.7 Boat-in Campsites

Several camps around Lake Oroville are accessible only by boat. Each contains six to ten individual campsites, except for the camp at South Bloomer, which will accommodate groups up to 75. The boat-in camps have cleared and leveled spots for tents, tables, stoves, garbage cans, and pit toilets are provided at each site. The boat-in campgrounds (BIC) are located at Bloomer Area include Bloomer Cove, Bloomer Knoll, Bloomer Point and Bloomer Group, Craig Saddle, Foreman Creek, and Goat Ranch.

The boat-in camps were constructed in the winter of 1970 by Department of Parks and Recreation personnel and Conservation Camp crews from the State Division of Forestry and Department of Corrections.

2.2.2.8 Floating Campsites

Ten floating campsites, located in Potters Ravine about 2-1/4 miles from the Bidwell Canyon Campground launch ramp, are available on Lake Oroville. Each 20 x 24 ft floating platform includes a camp table, two-burner propane cook stove, propane barbeque, food storage locker and cabinets, covered living area, and an upstairs deck. A limited supply of drinking water is provided, and a flush toilet with holding tank is part of each campsite. The restroom area includes space for changing clothes. Lockable storage space is also provided on the campsite. Each floating campsite is limited to 15 occupants, and all sites are suitable for handicapped use.

2.2.2.9 Diversion Pool Day Use Area

The Diversion Pool Day Use Area, located below the dam and above Thermalito Forebay, is open for day-use activities such as swimming and picnicking. Only non-motorized boats are allowed in this area. The only developed facility in this area is a vault restroom; two shoreline points have been enhanced with gravel to facilitate launching.

2.2.2.10 North Thermalito Forebay Recreation Area

Operations of the North Thermalito Forebay Recreation Area commenced on October 11, 1967, when water was allowed to flow from the Diversion Dam Pool into the Power Canal and then into the Forebay. It offers a 300-acre day-use area for picnicking, swimming, as well as in-route camping. The North Thermalito Forebay Recreation Area is reserved exclusively for sailboats, canoes, and other nonpower-driven boats. The

200 yard sandy swimming beach is complemented by men's and women's dressing rooms and chemical toilets are nearby. New restroom, utilities and improvements were constructed in 1997 and completed in 1998 by J.R.L Construction. Parking renovation was started in 2000 and finished in 2001 by Franklin Construction.

2.2.2.11 South Thermalito Forebay Recreation Area

Operations of the South Thermalito Forebay Recreation Area commenced on October 11, 1967. It provides outdoor recreational activities such as boating, picnicking, fishing and swimming. Power boating and fishing are the main attractions. The construction of a four-lane boat launch started in 1970 and was finished in 1971.

2.2.2.12 Monument Hill Day Use Area

Monument Hill Day Use Area is open for boating, swimming, fishing, picnicking and limited hunting. The surface and shoreline are within the Oroville Wildlife Area (OWA), but recreation facilities and boat ramps are managed by DWR. The parking lot was improved by Franklin Construction from October 1998 and completed in April 1999.

2.2.2.13 Thermalito Afterbay Launch Ramps

Thermalito Afterbay Launch Ramps include Larkin Road Launch Ramp, Monument Hill Launch Ramp and North Wilbur Road Launch Ramp. Robinson Construction Company constructed the entry road and extruded concrete curbs of Larkin Road Launch Ramp from February 1999 to February 2000. The boat boarding floats and gangway of Monument Hill Launch Ramp was constructed from October 1993 and finished on October 1994 by Hallsten Corp, and modified by Clayborn Construction Company from August 1998 to January 1999. North Wilbur Road Launch Ramp's boat boarding floats and piles were built by Clayborn Contracting Group between 1998 and 1999. The boat launch ramp consists of a two-lane paved boat launch ramp and parking lot able to accommodate 14 car/trailer combination spaces. There are several boat launching areas not graded and are consequently only suited for car-top launching.

2.2.3 Interim Projects

Early in the ALP, DWR agreed to consider implementing some actions prior to receiving a new license provided no license amendment was needed, environmental review requirements were limited, and there was agreement to include the actions in the new license application when filed. A number of these interim projects have been completed prior to 2005, and are described in detail in Section 3.1.2.2 of the PDEA.

2.2.4 Oroville Wildlife Area (OWA)

Located southwest of Lake Oroville, the OWA contains a series of ponds and levees adjacent to the Feather River including Thermalito Afterbay. The Thermalito Afterbay Outlet Camping Area also provides swimming and fishing access to the OWA ponds and the Feather River. Fishing, hunting, nature study, and river-associated recreation such as shooting and hunting are the primary activities at the wildlife area. A FERC

License Amendment dated November 1, 1996 approved addition of the OWA as part of the licensed Oroville Facilities.

The construction history of the recreation facilities is summarized in Table C.2.2-1.

Table C.2.2-1. Summary of construction activities and modifications to Oroville recreation facilities.

Facilities	Start of Construction	Construction Completed	Constructor
A. Campground:			
- Bloomer Cove Boat-In Campsite (BIC)	1973	1974	
- Bidwell Canyon Campground	06-Nov-81 Oct. 95	12-Dec-81 Jan. 96	Robinson Const. Co. Clayborn Const. Co.
- Floating Campsites (Spec. 96-03)	01-May-96	13-Sept-96	Weston Const. Corp.
- North Thermalito Forebay RV "En Route" Campground	01-May-96	01-Oct-96	DWR
- Lime Saddle Campground (Spec. 00-14)	27-Sept-00	03-Jun-02	Remcon
B. Day Use Area (DUA):			
- Spillway Boat Launch Area and DUA	1965 1968 2001	1966 1969 2003	C & C Construction
- Feather River Fish Hatchery	16-May-66 06-May-98	12-Dec-67 29-Jul-99	Peterson & Brown Ely Ginno + K9 Const. Inc.
- Loafer Creek Boat Launch Area	1966	1967	
- Lime Saddle Boat Launch Area and DUA	1971 1975 1993	1972 1976 1994	Guiton & Sons
- Lake Oroville Visitor Center	1973	1974	
- Enterprise Boat Launch Ramp	1973	1974	
- Bidwell Canyon Boat Launch Area and DUA	01-Nov-89 09-Sept-92 Nov-02	15-Dec-89 10-Dec-92 Feb-03	The Holland Co. Clayborn Contr. Group Guiton & Sons
- Thermalito Afterbay (North Wilbur Road) Boat Launch Area	08-Dec-93	26-Jan-94	Clayborn Contr. Group
- Oroville Dam restrooms and lighting	04-Mar-94	31-Mar-95	DWR
- Diversion Pool (Cherokee Road access)	01-Jul-95	14-Jun-96	DWR
- Thermalito Afterbay (Monument Hill) Boat Launch Area and DUA (Spec. 95-30)	07-Nov-95 Oct. 1998	24-Jun-96 Apr. 1999	Claborn Contracting Group Franklin Const.
- North Thermalito Forebay DUA	25-Oct-96 1997 2000	06-Jun-97 1998 2001	Mark Guiton & Assc. J.R.L Const. Franklin Const.
- Floating Restrooms	01-Aug-98	08-May-99	DWR
- Thermalito Afterbay (Larkin Road) Car-Top Boat Launch Area	Feb. 1999	Feb. 2000	Robinson Const. Co.

Source: Final Construction Reports/O&M License and Regulatory Compliance Sect

2.3 ADDITIONS/MODIFICATIONS

2.3.1 Turbine Refurbishment – Units 1, 3, 5

Turbine Refurbishment for Hyatt Pumping-Generating Plant is currently underway. The reassembly and refurbishment of Unit 5 is done. This unit was watered up on June 27, 2003 and start up testing by June 30, 2003. The second unit was released for refurbishment on February 18, 2003 while the third unit was scheduled for disassembly in October 2003. The contract for turbine refurbishment was awarded to Voest-Alpine MCE Corp. on December 31, 1998, under contract number C51167. The contractor sent a notice to begin work (NTBW) to DWR on February 2, 1999. The turbines refurbishment work is expected to be completed in April 2005.

2.3.2 Furnish Governor Replacement

Hyatt Pumping-Generating Plant and Thermalito Pumping Generating Plant's governor replacement are almost complete. Unit 1 commissioning is completed. All item governors have been delivered and installed. Sulzer Compression, Inc. contractor started the governor replacement on November 24, 1999, contract number C51193. Governor replacement work was completed in January 2004.

2.3.3 Turbine Replacement – Units 2, 4, 6

Turbine Refurbishment for Hyatt Pumping-Generating Plant – Units 2, 4, and 6 began on November 7, 2001 by G.E. Hydro Power, Inc., under contract number C51239. Contractor has postponed pump turbine model tests in order to optimize the final model design. The model test was completed in 2003. The turbines' refurbishment is expected to be completed on December 15, 2006.

2.3.4 Furnish Spare Stator Coils

Contract was awarded to G.E. Hydro Power, Inc., contract number C51259, for Furnishing Spare Stator Coils at Thermalito Pumping-Generating Plant. Notice to Begin Work was received on September 6, 2002. Prototype sample coils have been successfully tested. Production of the coils was scheduled to be completed July 7, 2003. The stator lamination was manufactured and delivered to the site. Installation of the stator coils continued during calendar year 2004.

2.4 TRANSMISSION LINES AND SUBSTATIONS

The license capacities of Hyatt Pumping-Generating Plant and Thermalito Pumping-Generating Plant are 645 MW and 114 MW respectively. Design and construction were authorized in 1964 under provisions of the Burns-Porter Act. The Department of Water Resources entered into the contract on April 21, 1965 with the consulting firms of St. Maurice-Helmkamp-Musser, as sponsor of a joint venture.

Maurice-Helmkamp-Musser was responsible for the survey, and International Engineering Company, Inc., was responsible for design. After changing the plan

several times by Amendment I, dated September 1, 1965, Amendment II, dated January 1, 1966, and Amendment III, dated October 13, 1966, the final transmission and circuit tower lines were built.

Two lines of double circuit towers carrying three 230kV circuits extend from the Hyatt Pumping-Generating Plant 230kV Switchyard to the Table Mountain Tap. From Table Mountain two lines of double circuit towers carrying three circuits extend to the Pacific Gas and Electric Company's Table Mountain substation and one double circuit line goes to the Thermalito Pumping-Generating Plant 230kV Switchyard.

The distance from the Hyatt Pumping-Generating 230kV Switchyard and Thermalito Pumping-Generating Plant Switchyard to the Pacific Gas and Electric Company Table Mountain substation are about nine miles and 2.3 miles respectively. In addition to the above transmission lines, two underground 15-kV power lines provide electric service to Thermalito Diversion Dam Powerplant and to the Feather River Fish Hatchery. One underground 15-kV power line, 3.9 miles long, connects Thermalito Diversion Dam Powerplant Switchyard with Hyatt Pumping-Generating Plant's Switchyard. The second underground 15-kV power line connects Thermalito Diversion Dam Powerplant with the downstream Feather River Fish Hatchery.

The construction history of the Oroville Facilities (Project No. 2100) is summarized in Tables C.2.4-1 and C.2.4-2.

Table C.2.4-1. Chronology of progress of construction.

Activity	Start of Construction	Construction Completed	Constructor
DAM, RESERVOIR & POWER FACILITIES			
Diversion Tunnel No. 1 (Spec. 61-05)	18-Aug-61	16-Jan-64	Frazier Davis Const. Co.
Palermo Outlet Works (Spec. 61-15)	11-Dec-61	03-Jun-63	Morrison-Knudsen Co.
Oroville Dam (Spec. 62-05)	13-Aug-62	29-Jun-68	Oro Dam
Construction of Construction Headquarter (Spec. 62-27)	16-Nov-62	12-Dec-63	A. Teichert & Son
Furnishing & Installing Turbines and Pumps (Spec. 63-05)	17-Jun-63	18-Feb-71	Allis-Chalmers Manufacturing Co.
Hyatt Pumping-Generating Plant (Spec. 63-06)	24-Jun-63	16-May-67	McNamara Corp. & G.A. Fuller Co.
Quincy Rd. Relocation Oroville-Forbestown (Spec. 63-35)	03-Jan-64	08-Sep-65	Piombo Construction Co.
Thermalito Turbines, Pump – Turbines and Governors (Spec. 63-39)	25-Feb-64	17-Mar-70	Allis-Chalmers
Furnishing 114 Inch Spherical Valves (Spec. 64-13)	30-Mar-64	16-May-69	Baldwin-Lima-Hamilton
Furnishing & Installing Generator&Motor/Generator (Spec. 64-16)	03-Jul-64	04-May-72	Westinghouse Corp.
Thermalito Power Canal Relocation (Spec. 64-31)	30-Oct-64	10-Nov-65	Osborn Construction Co.
Thermalito Pumping-Generating Plant (Spec. 64-37)	04-Dec-64	13-Feb-69	Guy F. Atkinson Co.
Furnishing Radial gates and hoists for Thermalito Diversion Dam (Spec. 64-43)	15-Dec-64	16-Nov-66	Berkeley Steel Const. Co., Inc.
Clearing Oroville Reservoir site (Spec. 65-05)	12-Apr-65	08-Jun-67	C.J. Langenfelder & Son, Inc.
Intake Trashracks and Shutters (Spec. 65-11)	30-Apr-65	22-Dec-67	Michel & Pfeffer Iron Works, Inc.
Furnishing and Installing One Generator and Three Motor – Generators Thermalito Pumping Plant (Spec. 65-02)	03-Jun-65	03-Sep-69	Allis-Chalmers
Oroville Dam Spillway (Spec. 65-09)	25-Jun-65	12-Mar-68	Oro Pcfc Cnst & G. Farnsworth Cnst. Corp.
Feather Falls Rd. Relocation South Fork Feather River Bridge and Roadway (Spec. 65-26)	10-Aug-65	24-Jan-68	Rthchld, Rfin & Wirck, Inc. & Piombo Const. Co.
Power Transformer-substation Transformer & Lighting (Spec. 65-31)	25-Aug-65	18-Aug-69	Moloney Electric Co.
Thermalito Power Canal (Spec. 65-37)	07-Oct-65	31-Oct-67	Morrison-Knudsen Co., Inc.
Thermalito Forebay and Afterbay (Spec. 65-27)	25-Oct-65	19-Apr-68	Guy F. Atkinson Co.
Falls Road Relocation Feather (Spec. 65-23)	23-Dec-65	28-Sep-67	O.K. Mittry & Son
230 KV Power Circuit Breakers (Spec. 65-38)	29-Dec-65	25-Feb-69	General Electric Co.
Completion of Hyatt Pumping-Generating Plant (Spec. 66-32)	31-Aug-66	23-Jun-69	Wismer & Becker

Table C.2.4-1. Chronology of progress of construction.

Activity	Start of Construction	Construction Completed	Constructor
DAM, RESERVOIR & POWER FACILITIES			
Oroville-Thermalito Control system (Spec. 66-44)	17-Oct-66	18-May-72	Philco Corp.
Oroville Operation & Maintenance Center (Spec. 66-52)	23-Jan-67	15-Apr-68	Christensen & Foster
Oroville-Thermalito Bus Lines (Spec. 67-01)	06-Feb-67	29-Aug-68	Wismer & Becker Contracting Engineers
Completion of Penstock Intake – Left Abutment (Spec. 65-52)	25-Jan-68	14-May-68	Yuba Consolidated Industries, Inc.
Thermalito Fish Rearing Raceways (83-06)	25-Apr-83	20-Mar-84	Kaweah Construction Co
Powerplant-furnishing Turbine-Generator Governor (Spec. 84-19)	01-Aug-84	03-May-88	Hitachi America, Ltd.
FISH FACILITIES			
Interim Facilities Feather River Hatchery (Spec. 62-01)	16-Mar-62	19-May-64	Frazier-Davis Construction Co.
Feather River Fish Hatchery (Spec. 66-18)	16-May-66	18-Dec-67	Peterson & Brown-Ely

Source: Final Construction Reports

The commercial operation date for Thermalito Power Canal, and Thermalito Forebay and Afterbay was 1967, while Oroville Dam, Hyatt Pumping-Generating Plant, and Powerplant-furnishing Turbine-Generator Governor were 1968, 1969, and 1988, respectively.

Table C.2.4-2. Major capital additions/modifications to the Oroville Facilities.

Activity	Start of Construction	Construction Completed	Constructor
DAMS, RESERVOIR & POWER FACILITIES			
Motor/Generator Armature Windings (Spec. 78-51)	05-Jan-79	18-Jun-80	The Epoxylite Corporation
Furnishing 230KV Power Circuit Breaker (Spec. 82-29)	08-Oct-82	17-Oct-84	Brown Boveri Electric, Inc.
Thermalito Diversion Dam Powerplant (Spec. 84-44)	04-Dec-84	26-Aug-87	BRC-Resigned to Brown & Root, Inc.
Motor Generator Rewind Units 2, 3, and 4 (Emergency Contract), Thermalito Powerplant (Spec. 89-11)	24-Feb-89	09-Jul-90	Magnetek National Electric Const., Co.
Fiber Optic Cable (Spec. 89-18)	21-Jun-89	18-Apr-90	Clyde G. Steagal, Inc., Mid Valley Elec.
Boating Facilities Renovation – Lime Saddle Boat LA – Lake Oroville (Spec. 95-28)	19-Oct-95	17-Jul-96	Mark Guiton and Associates
Hatchery Expansion and ADA Modifications, Feather River Fish Hatchery and Oroville Area Control Center (Spec. 97-24)	06- May-98	17-Aug-99	Ginno
Turbine Refurbishment – Units 1, 3 and 5 (Spec. 98-22)	02-Feb-99	Estimated Apr 2005	Voest-Alpine MCE Corp.
Seal and Pave Roads (Spec. 99-13)	05-Aug-99	16-Aug-00	Franklin Construction
Furnishing Governor Replacement (Spec. 99-19)	24-Nov-99	08-Jan-04	Sulzer Compression, Inc
Fabrication/Rehabilitation, Thermalito Diversion Dam and Oroville Dam Spillway (Spec. 99-30)	03-Jan-00	26-Aug-02	Weston
Radial Gates Rehabilitation (Spec. 00-12)	18-Jul-00	26-Nov-01	ARB, Inc.
Radial Gate Rehabilitation (Spec. 00-11)	25-Jan-01	18-Mar-03	Dillingham Construction
Pump-Turbine Refurbishment Units 2, 4 and 6 (Spec. 01-11)	07-Nov-01	Work Continues	G.E. Hydro Power, Inc.
FISH FACILITIES			
Hatchery Expansion and ADA Modification, Feather River Fish Hatchery and Oroville Area Control Center (97-24)	06-May-98	17-Aug-99	Ginno & K9 Construction Inc.

Source: Final Construction Reports

3.0 PROPOSED NEW FACILITIES AND CONSTRUCTION SCHEDULE

The Department of Water Resources is not proposing any changes to the Oroville Facilities under the Proposed Action other than PM&E measures. A schedule for construction of PM&E measures has not yet been prepared, pending completion of settlement negotiations.

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